THE THREE HUNDREDTH ANNIVERSARY OF THE UNIVERSITY OF EDINBURGH

THIS week the University of Edinburgh is holding its Tercentenary Festival. An elaborate programme of festivities is being gone through by a collection of guests of literary, scientific, and social eminence such as rarely graces a British or even any foreign University seat. A mere recital of the list of those who are to be present to receive honorary degrees would be interesting, as showing the scope and catholicity of modern University culture. We see Hermite, Helmholtz, Pasteur, Haeckel, Virchow, Browning, Renan, Bishop Lightfoot, and Principals Tulloch and Rainy, capped by the same academic hand.

It may not be without interest to our readers to dwell for a moment on certain parts of the history of an organism whose appreciatory functions are so varied and at first sight even contradictory.

Three hundred years, though not an infant's age, is after all no great age for a University. Any uncertainty therefore that surrounds the early history of the University of Edinburgh is more the result of initial obscurity than the glamour of remote antiquity. She is, as some one has said, hopelessly modern. Nevertheless, her history is in some respects a very remarkable one. What has now developed into one of the largest of the Universities of Europe, numbering its students by thousands, began as a college for the "town's bairns," under the patronage of the Town Council, who in fact remained its rulers until 1859. There can be little doubt that the comparatively modern date of the foundation of the college, and the peculiar[1] nature of the governing body favoured its growth and development into what has claims to be the most liberally constituted of the Scottish Universities.

A glance at the chronology of science will show that the opening of the new Town's College in Edinburgh in 1583 falls at the time when the tide of progress in physical and mathematical science was just beginning to rise over Europe.

Napier of Merchiston was living hard by; Gilbert was probably collecting material for his great work on the magnet; and Galileo and Kepler were doing great things for physical science.

Nevertheless, the progress of the young institution was not at the outset very remarkable. This arose partly from the miserable poverty of its early endowment and of Scotland itself, partly from the plan of "regenting" on which it was organised, which compelled each of four regents to carry his students in four years through the whole course of the seven liberal arts of the mediæval curriculum. This plan, so fatal to special excellence in teaching or learning, continued until 1708, when it was finally abolished, and professors of the separate subjects established. During this first century, however, the patrons had already engrafted the germs of the modern University by appointing professors of separate subjects, which were sometimes outside the curriculum of the regents altogether, sometimes auxiliary to it. In this way arose some of the present chairs of the faculty of arts, and in this way originated many of the chairs that now form the separate faculties of theology, law, and medicine.

The powers of the Town Council left them absolutely unfettered in the founding of new chairs, and they proceeded in this work guided by their own views as to the necessities of the times, and aided by the best advice they could obtain inside, or more frequently outside, the University. They were not always quite judicious or wholly unbiased in their procedure, and many of their reforms were carried out in the face of bitter hostility from within the University. Yet it cannot be denied that, on the whole, their action as patrons and founders of chairs was for the good of the University. The sectarian feuds which occasioned the Disruption of the Established Church ultimately led, in 1859, to the severance of the close tie between the Town Council and the Town's College, long ere then grown into a full-blown University. There is no need here to dwell on the dark side of the picture of the management of the University by the Town Council. Their misdeeds are, we may hope, not likely to be imitated by modern patrons, and their enlightened policy in the foundation of chair after chair as the wants of the institution grew is, after all, the more important part of the story, and well worthy to be read in this day of infant Universities and of experiments on the large scale in the remodelling of older Universities of the kind.

As most of our readers probably know, the strength or weakness of a Scottish University depends wholly on the professoriate, with whom lie the whole of the teaching and disciplinary duties. Within certain limits set him by the Ordinances, and with some restrictions owing to the presence of colleagues in allied departments, a Scottish professor within his own classroom is absolutely free, and may develop into a great success, a mediocrity, or a great failure, according to circumstances; and with him rises or falls the department intrusted to his care. The system has its drawbacks sufficiently obvious; but it has this to say for itself, that it is an economical arrangement, and that it has produced a large body of citizens sufficiently well educated to take rather more than their own share of the higher employments in the British Empire. It will thus be seen that the interest of the educational history of a Scottish University centres mainly in the record of the occupants of its various chairs. We offer a few desultory remarks on this subject, chiefly from the scientific point of view, referring those who are interested in the matter generally to the recently published "Story of the University of Edinburgh," by Principal Sir Alexander Grant.

The earliest foundation of a special scientific chair was that of mathematics, to which the Town Council called James Gregory in 1674. This distinguished mathematician and physicist, the author of various theorems in pure mathematics and of several great ideas in optics (represented to the mind of the ordinary student by Gregory's "Series" and the Gregorian telescope), came of an Aberdeenshire family (related, by the way, to the notorious Rob Roy Macgregor), which, during the last three hundred years, has furnished something like a score of distinguished professors and men of science to the Scottish and English Universities. Gregory was not the first nominal Professor of Mathematics, but he was the first professor who had more than the name. After his brief but brilliant tenure, the office, with but little intermission, was filled by a line of distinguished followers, among whom we must content ourselves with naming David Gregory, who became Savilian Professor of Astronomy at Oxford, who was appointed on the urgent recommendation of Newton himself, who was in fact the friend and interpreter of Newton, and was by him reckoned worthy, along with Halley, to continue the great work of the co-ordination of celestial phenomena begun in the "Principia." He has the credit of introducing the Newtonian philosophy into the curriculum of Edinburgh thirty years before it obtained a similar place in the University of its author. Colin Maclaurin is the greatest perhaps of all the men of science that Edinburgh has produced; of his wide culture and extended activity we may give some idea when we say that he was a worthy successor to Newton in pure and applied mathematics, that he was a great teacher of mathematics and physics, a great popular lecturer in his day (one of the first of the scientific tribe of such, perhaps), that he was an authority on life assurance, on surveying, on geographical exploration, that he was an excellent classical

[1] Peculiar from a University point of view, for the older Universities as a rule were privileged corporations independent of, nay, often antagonistic to, the municipalities where they were situated.

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scholar, a man of great social qualities, and lastly, that he tried to organise a defence of the town of Edinburgh against the Pretender in 1745, and caught thereby the malady that ended his life. Other occupants of the chair were Matthew Stewart, still remembered for his "Propositiones Geometricæ"; John Playfair, distinguished as a critic and historian of science, introducer of the Continental methods into the mathematical studies of Edinburgh; John Leslie, an excellent geometer, but now better remembered for his contributions to the science of heat; and William Wallace, inventor of the eidograph.

At first, natural philosophy, in so far as it was distinct from Aristotelian physics, seems to have been in the province of the Professor of Mathematics. It was so in Maclaurin's time, although a separate professorship for it had been founded in 1708. The first professor that need be mentioned here is John Robinson, whose articles in the third edition of the *Encyclopædia Britannica* are still worth consulting, and whose "Elements of Mechanical Philosophy" was for a time a standard work on the subject. The original close connection between mathematics and natural philosophy probably led to what at first sight seems a curious succession of professors. It more than once happened—notably in the cases of Playfair and Leslie—that the holder of the Chair of Mathematics was transferred to that of Natural Philosophy; in fact, it was in the latter subject that both these professors attained their greatest distinction, the former by his account of the Huttonian Theory of the Earth, the latter by his well-known researches on heat. But the greatest of all the past Professors of Natural Philosophy was undoubtedly James David Forbes; he, along with David Brewster, at first his patron, and for a long time his rival, are to be reckoned among the greatest ornaments of the University of Edinburgh during the generation that has passed away. Both were students of the University and both were candidates for the Natural Philosophy Chair; Brewster, failing probably for political reasons, was reserved for the higher honour of the principalship. The works of these two great men are so fresh in the recollection of our readers that no words need be wasted here in emphasising them. It is worthy of mention, however, that the late James Clerk Maxwell and Prof. Balfour Stewart, whose fame sheds undying lustre on their Scottish *alma mater*, were trained in practical physics under Forbes.

The Chair of Chemistry, founded in 1713, was at first essentially a medical chair; its first occupant, James Crawford, was a remarkable man in every way, a pupil of Boerhaave, and well versed in what little chemical knowledge then existed. It is noteworthy, as showing the small extent of medical and chemical knowledge at that time, that he was also Professor of Hebrew! His immediate successors call for no remark until we reach Cullen (1755), who, though better known as a great physician, was also distinguished as a great teacher of chemistry; he was, in fact, the first to establish that science as a study separate and distinct from medicine. His two immediate successors, Black and Hope, followed his lead, and were very successful teachers; in fact, in Hope's time the class reached the astonishing number of 500. Besides being a good teacher, Black was a man of genius. His results regarding carbonic acid, embodied in his graduation thesis "De humore acido a cibis orto, et magnesia alba," and his discovery of latent heat form cornerstones in the structure of modern chemical and physical science. Perhaps the greatest praise is that Lavoisier regarded him as his master. Hope will be remembered for his experiments on the maximum density point of water, and for his discovery of strontia as a separate alkaline earth. In 1844 the chair became a chair of pure chemistry. Among the past professors since then we may mention Sir Lyon Playfair, whose scientific reputation is now overshadowed by his fame as an educational organiser, and an able political champion of the interests of science.

The Chair of Natural History was a later foundation (1770?), and at first was a sinecure. Since the beginning of the century, however, it has not wanted for distinguished occupants. Jameson (1804) was an excellent mineralogist; he founded the splendid museum now absorbed in the Museum of Science and Art, and must have been a great teacher to judge by the number of distinguished pupils that he trained, among whom were Edward Forbes, John and Harry Goodsir, Macgillivray, Nicol, and Darwin. The first of these succeeded him, but was cut off after a brief but brilliant career too well known to need description. The last of the past occupants of this chair, Wyville Thomson, has done the University of Edinburgh enduring honour by connecting it with that most fascinating of all the walks of modern natural science—the exploration of the deep sea.

The history of the Chair of Astronomy has been little but a record of misfortune, as far as the University is concerned. The first professor, Robert Blair, was endowed with a fair salary, but no Observatory was given him, and he never lectured or took any part in the work of the University. He is remembered chiefly for his researches on achromatic telescopes, which he brought to great perfection by means of fluid lenses of his own invention. The second professor, Thomas Henderson, was invested with the dignity and duties of Astronomer Royal for Scotland, and was provided with the present Observatory on the Calton Hill. He devoted himself ardently to his duties as an observer, and will be remembered as the first to determine the parallax of a fixed star (α Centauri). He never lectured. Where the blame of the unsatisfactory position of the Astronomy Chair and of the Edinburgh Observatory rests, and how the matter is to be remedied, is one of the vexed questions to be settled by the coming University Commission for Scotland.

The Chair of Technology was inaugurated with great promise of success by George Wilson, whose brilliant lectures and important services in connection with what is now the Museum of Science and Art showed how important such a chair might under favourable circumstances become. The chair was, however, abolished in 1859, under circumstances that do not appear to reflect much credit either on those who then acted for the Senatus, or on the Government department which was concerned in the transaction. It may be hoped that, now the importance of technical education is being recognised, the mistake then committed will be remedied. This is all the more to be desired because Edinburgh already possesses the rudiments of a technical faculty in the Chairs of Engineering and Agriculture.

There remains but one more Chair of Natural Science to be mentioned, viz. Geology. It numbers but one past professor, Archibald Geikie, concerning whom we need only express the wish that his followers may be worthy of him.

Although the subject scarcely belongs to these pages, yet no notice of the scientific side of the University of Edinburgh would be complete without at least an allusion to the glories of its medical school, which have attracted the admiration, if not occasionally the envy, of similar institutions. It may seem curious, but it began by the institution of a botanical, or, as it was properly then called, a physic garden. The keeper of this garden (originally it is believed a member of the characteristically Scotch Guild of Gardeners), was after a time constituted (1676) the first Professor of Botany, and in fact the first medical professor.

If it were needful to insist farther upon the important place which the University of Edinburgh occupies among the educational bodies of Great Britain, we might point to the number of her students that now hold professorial chairs all over the United Kingdom, and indeed through-

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out the British Empire; and to the work which her *alumni* have done, and are doing, in science both pure and applied.

It might be profitable also to dwell on her defects, which she has in plenty, like other institutions guided by human brains, and endued with her own share of human inertia. But, as she has no want of candid critics, and is by and by to be put into the refining crucible, along with the other Scottish Universities, to emerge, let us hope, purified and strengthened, we may content ourselves with offering her, and asking of readers to join us therein, a hearty wish that she may prosper during the next hundred years as she has done during the present century. G. CHRYSTAL

THE CONGO[1]

ALTHOUGH claiming to be little more than the record of a passing visit paid to the Lower Congo Basin towards the end of the year 1882, this is really a work of permanent interest to the naturalist and ethnologist. The author, a young and ardent student of biology in its widest sense, here conveys his impressions of

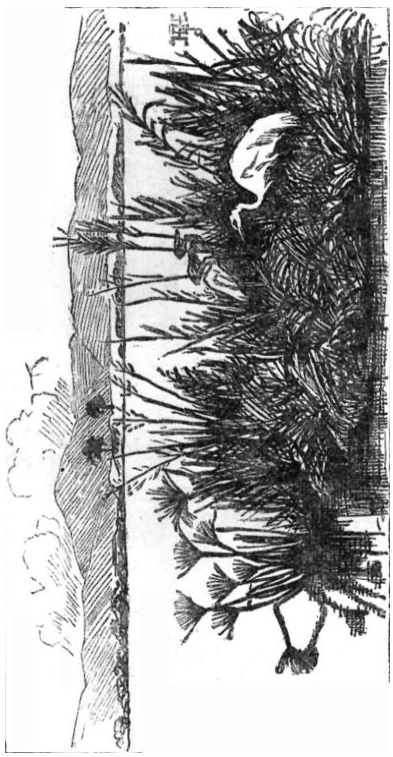

FIG. 1.—Floating Reed Island on Stanley Pool.

West African life and scenery in a series of graphic pictures, which owe much of their freshness and vigour to the circumstance that they are always drawn at first hand from nature, and are often an exact reproduction of jottings made with pen and brush in the midst of the scenes described. His skill as a draughtsman he turns to good account by illustrating the text with numerous drawings of plants, animals, and human types, many of which are absolute fac-similes executed by the Typographic Etching Company.

But Mr. Johnston does much more than merely describe in striking language the varied aspects of tropical nature revealed to his wondering gaze as he ascended from the low-lying marshy coastlands along the great artery from terrace to terrace to the grassy steppes and park-like uplands of the interior. Informed by the quickening influences of the new philosophy now accepted by all intelligent students of nature, he compares as he describes, carefully observes, and in apparently trifling incidents endlessly recurring throughout long ages he discovers the causes of mighty revolutions in the organic world. In Stanley Pool and elsewhere on the Congo he meets with numerous floating islands, tangled masses of aquatic vegetation, firmly matted together by their roots and fibres, and strong enough to bear the

FIG. 2.—*Lissochilus giganteus.*

weight of a man (see Fig. 1). These, like the huge snags and trunks of trees borne along by the swift current, are thickly peopled with all forms of animal and vegetable life, which are thus carried a long way from their original homes. Hence the inference that "on many rivers these floating trees must serve as a great means for the diffusion of species" (p. 283). So also in his recent work on the "Indians of British Guiana," Mr. Im Thurn notices the presence of turtles on the logs and stems swept down the rivers of that region.

[1] "The River Congo, from its Mouth to Bólóbó," by H. H. Johnston, F.Z.S. (Sampson Low, 1884.)

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